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ABSTRACT

Winter seems to hold more mysteries than any other season. It changes the behavior of wildlife and also brings about drastic changes in plant life. This unit, designed around the following two ideas: (1) to develop an appreciation and understanding of the winter season and (2) to understand how plants and wildlife are affected by the winter season, attempts to provide a study of the winter season on a level that special education students can understand. The activities are aimed at level II and III educable mentally retarded special education classes. There are four topics: (1) The Season of Winter, (2) Wildlife in Winter, (3) Field Trip--Plants in the Winter, and (4) Wildlife in Winter--A Continuation of Topic 2. For each topic there are behavioral objectives, student activities, and teacher suggestions. The number in parentheses by the activity number indicates the objectives the activity helps develop. The unit also includes goals and objectives, an objective summary sheet, a unit time line, a materials sheet, and 18 appendixes which contain various teaching aids related to the activities. (TK)

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ENVIRONMENTAL EDUCATION PROJECT
ESEA TITLE III, SECTION 306

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A unit developed by the Environmental Education Project Staff, January, 1973, for Level II and III Educable Mentally Retarded Special Education classes.

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THE WINTER ENVIRONMENT

SE 017 401

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Foreword

The winter season seems to hold more mysteries than any other season. When winter is mentioned, one automatically thinks of cold weather, sleet, ice, and snow. But winter is more than this. It changes the behavior of wildlife and also brings about drastic changes in plant life.

The majority of children see a great deal of plants and wildlife during the spring, summer, and fall seasons; however, when the winter weather sets in these seem to be forgotten. Children need to be made aware of the effects of winter on plant life and to study the balance of nature during the winter.

This unit is designed to provide study of the winter season on a level that special education students can understand. The activities are aimed at level II and III educable mentally retarded special education classes. There are four topics: 1) The Season of Winter; 2) Wildlife in Winter; 3) Field Trip - Plants in the Winter; and 4) Wildlife in Winter - A Continuation of Topic 2.

For each topic there are behavioral objectives, student activities, and teacher suggestions. The numbers in parentheses by the activity number indicate the objectives the activity helps develop. Teaching aids are located in the Appendix.

A variety of activities are given for each objective. It is not expected that every activity will need to be used to achieve a specific objective. The variety exists so that teachers may select the activities that are appropriate for individual students and their specific class. Teachers should feel free to modify or substitute activities to accomplish the objectives of the unit. Some objectives are more difficult than others. Teachers may select and teach those objectives in the unit that fit their class. Those objectives taught can be evaluated by pre and post tests developed for the unit.

Thad Whiteaker

Thad Whiteaker
Program Specialist - Special Education

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Special recognition is given to the Board of Education for the Topeka Public Schools, who approved and are supporting this creative, exemplary and innovative project.

My sincere gratitude is extended to the program specialists for their tireless efforts in developing this curriculum for special education. Curriculum development and revision has extended the working days for these staff members. My personal thanks are given to Thad Whiteaker, Bob King, and Glenn Clarkson for an outstanding job.

The enclosed curriculum is the result of input from the project's paraprofessionals, level II and III special education teachers, Capper Foundation teachers, Community Council members, parents, students, and interested lay citizens.

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Donald French

Donald French
Project Coordinator

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Goals and Objectives

Goals: 1) To develop an appreciation and understanding of the winter season.
2) To understand how plants and wildlife are affected by the winter season.

Behavioral Objectives:

1. Given four choices, 75% of the students will select "4" as the number of seasons in a year.

2. Given the statement "The seasons of the year are spring, summer, fall, and winter," 75% of the students will indicate that this is a true statement.

3. Given four choices, 50% of the students will select "December, January, February, March" as the months during which the winter season occurs.

4. From a list of four different temperature readings, 60% of the students will indicate that a 90° reading would not be likely to occur during the winter season.

5. When given the months of April, July, September, and January, 50% of the students will indicate that a 10° temperature would most likely occur during January.

6. Given the months of May, August, September, and February, 35% of the students will indicate that February has shorter days.

7. Given four choices, 75% of the students will select "grows a heavy coat of fur" as a way that some animals prepare for winter.

8. Given four choices, 75% of the students will select "migrate" as the thing that some birds do as the winter season approaches.

9. Given four choices, 75% of the students will select "rabbit" as an animal that does not hibernate during the winter.

10. Given four choices, 50% of the students will indicate that hibernating animals get ready for winter by eating a lot of food.

11. Given four choices, 50% of the students will select "moving from one area to another" as the choice that describes migration.

12. Given four choices, 50% of the students will indicate that some animals hibernate during the winter months because there is a shortage of food.

13. Given four choices, 50% of the students will select "grass" as a plant that does not die in the winter.

14. Given four choices, 50% of the students will indicate that the main reason many trees do not grow much during the winter is because they lose their leaves.

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15. Given four choices, 50% of the students will select "evergreen" as the kind of trees that do not lose their leaves during the winter.

16. Given four choices, 50% of the students will select "decay and turn into soil" as the thing that happens to plants that die during the winter.

17. Given four choices, 50% of the students will select "presence of buds" as a way of telling that trees are alive during the winter.

18. Given four choices, 35% of the students will indicate that a plant that produces seeds then dies each year is called an annual plant.

19. When given a choice of four seasons, 60% of the students will indicate that winter is the hardest season for wildlife.

20. Given four choices, 50% of the students will indicate that snow is a special hardship on some kinds of wildlife because it covers their food supply.

21. Given four choices, 75% of the students will select "grasshoppers" as the insect that will die because of cold weather.

22. Given four choices, 50% of the students will select "beetle" as the insect that will sleep through the winter.

23. Given four choices, 75% of the students will indicate that people can help birds in the winter by putting out food for them.

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Objective Summary

Objective Number	Concept Within the Objective	District Expected Criteria	Test Question Number	Class Pretest Results	Class Posttest Results
1	The number of seasons in a year.	75%	1	____	____
2	The names of the seasons.	75%	2	____	____
3	The months of the winter season.	50%	3	____	____
4	Temperatures occuring during the winter season.	60%	4	____	____
5	Temperatures occuring during the winter season.	50%	5	____	____
6	Length of days during the winter season.	35%	6	____	____
7	Ways that animals prepare for winter.	75%	7	____	____
8	Some birds migrate as winter approaches.	75%	8	____	____

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Objective Summary Sheet (cont'd)

Objective Number	Concept Within the Objective	District Expected Criteria	Test Question Number	Class Pretest Results	Class Posttest Results
9	Rabbits do not hibernate during the winter.	75%	9	____	____
10	Animals that hibernate eat a great deal in preparation for winter.	50%	10	____	____
11	A definition of migration.	50%	11	____	____
12	A shortage of their food supply is one reason why animals hibernate.	50%	12	____	____
13	Grass does not die during the winter.	50%	13	____	____
14	The loss of leaves during the winter cuts down on the growth of the tree.	50%	14	____	____
15	Evergreens do not lose their leaves during winter.	50%	15	____	____
16	Dead plants decay and make soil.	50%	16	____	____

Objective Summary Sheet (cont'd)

Objective Number	Concept Within the Objective	District Expected Criteria	Test Question Number	Class Pretest Results	Class Posttest Results
17	Buds indicate life in a tree during the winter.	50%	17	____	____
18	An annual plant produces seeds and dies each year.	35%	18	____	____
19	Winter is the most difficult season for wildlife.	60%	19	____	____
20	Snow makes life difficult for some wildlife by covering up their food supply.	50%	20	____	____
21	Cold weather kills off grasshoppers.	75%	21	____	____
22	Beetles hibernate through the winter season.	50%	22	____	____
23	People can help birds during the winter.	75%	23	____	____

Unit Time Line

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DAY

Before the trip

X Administer pretest to students.

Schedule all films that are to be used.

Prepare flannel board for Activity #2.

Begin study of unit.

Contact Environmental Education office if thermometers are needed.

Prepare duplicates of all graph work that is to be used.

Contact project staff to set up a field trip date.

14 Submit field trip request to building principal. Check with principal to see that all requirements for notification of parents have been fulfilled.

7 Meet with program specialist to go over field trip details.

1 Contact program specialist to affirm readiness for trip on the following day. Give students the instructions they will need to be fully prepared for the trip. Remember the weather may be cold!

0 Field Trip.

After the trip

1 Begin follow-up study.

Prepare for plant and animal reports.

Prepare duplicates for Activity #21.

Prepare questions for Activity #24. See Appendix XIV.

Complete unit study.

Administer posttest to students.

Fill out Teacher's Unit Evaluation and submit to program specialist.

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Materials Sheet

This materials list gives a preview of the materials that will be needed to effectively teach the unit. Read in four columns. 1) Name and/or description of the activity needing the material, 2) Number of the activity, 3) Page number of the activity, and 4) List of materials needed for the activity.

Activity	Activity Number	Page Number	Materials
View film and discuss	1	9	Film: Seasons of the Year
Making a flannel board picture.	2	10	Plywood or heavy cardboard 3' x 5', outing flannel, mystic tape or thumb tacks, crayons and construction paper.
Thermometer demonstrations	3	10	Thermometers, ice cubes, water, glass containers, pot or pan, and heat source.
Making thermometers	4	11	Box top, red and white ribbon, stapler or glue.
Making a Season Graph	5	12	Duplications of Season Graphs, see Appendix II, III, and IV.
View film and discuss	6	12	Film: Warm and Cold Blooded Animals
Studying Length of Days	7	13	Duplications of Length of Days Graphs: see Appendix V, VI, and VII.
View film and discuss	8	14	Film: Winter: A Story of Survival
View film and discuss	10	15	Film: Birds in Winter

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Materials Sheet (cont'd)

Activity	Activity Number	Page Number	Materials
Fur-temperature demonstration.	11	16	Two tin cans of equal size, two thermometers, container with a pouring spout, glue, cotton, and hot water.
View film and discuss	12	16	Film: Hibernation: Forms of Dormancy
Wildlife Classification	13'	17	Duplicates of classification activity: see Appendix IX.
View film and discuss	14	17	Film: Migration of Birds: The Canada Goose
View film and discuss	15	18	Film: Plants Live Through the Winter
Wildlife Picture Wheel	16	18	Duplicates of Picture Wheel. See Appendix X.
View film and discuss	18	22	Film: Animals In Winter
Winter Wildlife Fill-In	21	24	Duplicates of winter wildlife fill-in sheet. See Appendix XII.
View film and discuss	22	24	Film: Birds that Migrate
The Question Box	24	25	Questions on small strips of paper. See Appendix XIV.

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TOPIC I: The Season of Winter

Behavioral Objectives:

1. Given four choices, 75% of the students will select "4" as the number of seasons in a year.
2. Given the statement "The seasons of the year are spring, summer, fall, and winter," 75% of the students will indicate that this is a true statement.
3. Given four choices, 50% of the students will select "December, January, February, March," as the months during which the winter season occurs.
4. From a list of four different temperature readings, 60% of the students will indicate that a 90^{o} reading would not be likely to occur during January.
5. When given the months of April, July, September, January, 50% of the students will indicate that a 10^{o} temperature would most likely occur during January.
6. Given the months of May, August, September, February, 35% of the students will indicate that February has shorter days.

Student Activities	Teacher Suggestions
1. (Obj. 1-23) Film: Seasons of the Year 1. How many seasons are there in a year? 2. What are the names of the seasons? 3. During which months does the winter season occur? 4. What happens to insects, animals, and birds during the winter season? 5. What happens to plants during the winter season? 6. What happens to the leaves that fall to the ground during the winter? 7. How can you tell that a tree is alive during the winter if it has no leaves?	1. (Obj. 1-23) Film: Seasons of the Year 1. This film is available from the Topeka Schools Film Library. Schedule it through your own schools media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. Objectives 1 through 6 will be emphasized with this film and objectives 7 through 23 will also be reinforced with this film. 5. Emphasis is on: 1) the number of seasons; 2) the names of the seasons; 3) when they occur; 4) characteristics (animal, plant, weather)of the seasons.

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Student Activities	Teacher Suggestions
2. (Obj. 1-6) Flannel Board Picture 1. How does your school neighborhood look during spring? When does spring occur? 2. How does your school neighborhood look during summer? When does summer come? 3. How does your school neighborhood look during fall? When does fall come? 4. How does your school neighborhood look during winter? When does winter occur?	2. (Obj. 1-6) Flannel Board Picture 1. Make a flannel board from plywood or heavy cardboard 3' x 3'. 2. Over this stretch a piece of outing flannel very tightly. 3. Fold it over the edges and fasten securely to the back with mystic tape or thumb tacks. 4. With colored crayons, draw a picture on the flannel of all the stationary objects within the vicinity of your school, your own school building, houses, etc. 5. Cut out pictures from colored construction paper (which will stick to the flannel) of scenes for different seasons. 6. Example: put up the word SPRING. Beneath it put the words MARCH, APRIL, MAY, JUNE. This is the season and the months in which it occurs. Make the pictures show how your school neighborhood would look during the spring season. 7. Do the same for the summer, fall, and winter seasons. This would probably be done at various intervals.
3. (Obj. 1-23) Thermometer Activities 1. Which way does the colored part of the thermometer move when it is in the ice cubes?	3. (Obj. 1-23) Thermometer Activities 1. You will need a glass container with ice cubes; a pan of water on a hot plate or a stove; a glass of regular tap water.

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Student Activities	Teacher Suggestions
2. Which way does the colored part of the thermometer move when it is in the hot water? 3. Where is the colored part of the thermometer when it is in the regular water?	2. You may do this while the class observes; you may do this in small groups or individually. 3. Place a thermometer in a glass filled with ice cubes. Record the temperatures on paper or on the board. 4. Place a thermometer in a glass of regular tap water. Record the temperature on paper or on the board. 5. Place a thermometer in a pan of water that is on a hot plate or stove burner. Record the temperature on paper or on the board. 6. Caution the students about the dangers involved around a burner and hot water. 7. Environmental Education Project will supply thermometers if needed. 8. Do this activity only if you feel it is necessary to reinforce or teach thermometer skills that may be necessary for Activity #5.
4. (Obj. 1-23) Thermometers 1. Follow instructions given by the teacher in constructing a model thermometer.	4. (Obj. 1-23) Thermometers 1. <u>Do this activity only</u> if you feel it is necessary to reinforce or teach thermometer skills that may be necessary for Activity #5. 2. Each student may do this so there will be a thermometer on every desk. 3. See Appendix I for instructions on preparation of a thermometer. 4. Appendix I also contains instructions for an activity relating to the thermometer made by the students. 5. You can make your own large thermometer for the whole class to see.

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Student Activities	Teacher Suggestions
5. (Obj. 1-23) Season Graph 1. How many seasons are there? 2. Can you name the seasons? 3. When does each season occur? 4. What are some things that happen to weather, plants, and wildlife during each season? 5. During which season do animals and insects hibernate? 6. When do birds migrate? 7. What season is the warmest? 8. What season is the coldest? 9. During what season do trees leaves change color? 10. During what season do the buds on trees begin to bloom?	5. (Obj. 1-23) Season Graph 1. There are several options with this activity. Use the one that fits your class. 2. Appendix II shows a graph that has temperatures, activities, and names of seasons already written in. Simply have your students draw lines to connect the temperature readings and use the sheet for a discussion. You may use a large model on the board as a guide for the students. 3. Appendix III is an unfinished graph. The students would use the information given in Appendix IV to complete this graph. When completed it should be like the graph in Appendix II. 4. Check all objectives before doing this activity. It is particularly relative to objectives 1-6.
6. (Obj. 1-6; 9, 12, 14) Film: Warm and Cold Blooded Animals 1. Why do some animals grow a heavy coat during the winter? 2. Why do they have a thin coat during the summer? 3. Why do some animals hibernate? 4. Can you read the thermometers in the movie?	6. (Obj. 1-6; 9, 12, 14) Film: Warm and Cold Blooded Animals 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. This film has quite a few thermometer scenes. If activity #5 is used, this might be a good follow-up.

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Student Activities

7. (Obj. 1-6)

Length of Day Graph

1. Which month has the longest days?
2. Which month has the shortest days?
3. Which season has the longest days?
4. Which season has the shortest days?
5. Do you think some plants die because there isn't enough sunlight during the winter season?
6. Do you think the short days during the winter causes some animals to hibernate? or migrate?

Teacher Suggestions

7. (Obj. 1-6)

Length of Day Graph

1. Objectives 1-6 can be emphasized with this activity. Be especially carefui to emphasize objective #6.
2. There are options to this activity. Choose the one with the level of difficulty that fits your class.
3. Appendix V is a bar graph showing the average length of days during each month of the year. Information on each season is also written on the graph. Use this for a discussion.
4. Appendix VI is a graph without the information written in.
5. Appendix VII gives you the information to be used in filling out Appendix VI.

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TOPIC II: Wildlife in Winter

Behavioral Objectives:

7. Given four choices, 75% of the students will select "grows a heavy coat of fur" as a way that some animals prepare for winter.

8. Given four choices, 75% of the students will select "migrate" as the thing that some birds do as the winter season approaches.

9. Given four choices, 75% of the students will select "rabbits" as an animal that does not hibernate during the winter.

10. Given four choices, 50% of the students will indicate that hibernating animals get ready for winter by eating a lot of food.

11. Given four choices, 50% of the students will select "moving from one area to another" as the choice that describes migration.

12. Given four choices, 50% of the students will indicate that some animals hibernate during the winter because there is a shortage of food.

Student Activities	Teacher Suggestions
8. (Obj. 1-23) Film: Winter: A Story of Survival 1. View the film. Be prepared for a discussion on: 1) plants in the winter; 2) animals in winter; 3) insects in winter.	8. (Obj. 1-23) Film: Winter: A Story of Survival 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. This film will help achieve many of the objectives of the unit. It is a very good film.

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Student Activities	Teacher Suggestions
9. (Obj. 7-12; 19-23) Story: Walk In the Winter Woods 1. Can you think of two animals that will eat branches of shrubs and trees during the winter? 2. How can you tell an evergreen tree from the other trees during the winter? 3. How do some insects survive the winter?	9. (Obj. 7-12; 19-23) Story: Walk In the Winter Woods 1. This story is contained in Appendix VIII. 2. The story is taken from Ranger Rick's Nature Magazine, January, 1972. 3. Read the story to your class. Emphasize the portion on rabbits and deer, tree buds and leaves. 4. Discuss the story with the students after reading it to them.
10. (Obj. 8, 11, 19, 20, 23) Film: Birds In Winter 1. How many migrating birds can you name? 2. Why do some birds migrate? 3. Why do some birds stay in the same area during the winter? 4. What is the biggest problem for birds during the winter? 5. How can people best help birds during the winter?	10. (Obj. 8, 11, 19, 20, 23) Film: Birds In Winter 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. This film will help meet objectives 8, 11, 19, 20, 23. 5. Emphasize that snow covers birds food supply during the winter. 6. Emphasize that it is lack of food, not cold, during the winter that harms birds. 7. Emphasize that most birds do not store food for the winter.

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Student Activities	Teacher Suggestions
11. (Obj. 7) Fur - Temperature Demonstration 1. What was the starting temperature of the water in each can? 2. What were the temperatures of the two cans an hour later? 3. Which can lost the most heat? 4. How would a covering of fur help an animal in cold weather?	11. (Obj. 7) Fur - Temperature Demonstration 1. You will need the following materials for this demonstration: 1) 2 tin cans - equal size; 2) 2 thermometers; 3) container with a pouring spout; 4) glue; 5) cotton; 6) hot water. 2. Remove the papers from the two tin cans. Coat the outside of one can with glue. 3. Put a thin layer of cotton over the outside of the can. Wait a few minutes for the glue to dry. Fluff the cotton by pulling it outward. 4. Fill both cans with hot water from the same container. Make sure each can has the same amount of water. Be careful not to get the cotton wet. 5. Measure the temperature of the water in each can. Record these temperatures. 6. Wait an hour. Measure the temperatures in each can again. Record these temperatures.
12. (Obj. 7, 9, 10, 12, 21, 22) Film: Hibernation: Forms of Dormancy 1. Why does a wild bear eat a lot before it begins to hibernate? 2. Why do animals such as bears, fox, and coyotes grow a heavy coat of fur for the winter season? 3. Do all spiders die during the winter? 4. How does a beetle live through the winter?	12. (Obj. 7, 9, 10, 12, 21, 22) Film: Hibernation: Forms of Dormancy 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. This film will be especially helpful in achieving objectives 7, 10, 12, and 22.

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Student Activities	Teacher Suggestions
	5. Be particularly careful to focus on the scenes showing how beetles survive the winter. 6. Even though it is not shown, this will be a good time to mention insects, such as grasshoppers, that are killed by the cold weather in winter.
13. (Obj. 7-12; 19-23) Classification 1. Place the name of the animal, insect, or plant in the space at the end of the sentence that best describes it.	13. (Obj. 7-12; 19-23) Classification 1. This is a word completion activity. 2. See Appendix IX for a copy of the fill-ins. This can be duplicated. 3. Students are to take the name of the animal from the bottom of the page and put it in its proper place in the sentences numbered 1 through 9. 4. The name of each animal will only be used once.
14. (Obj. 8, 9, 19, 20, 23) Film. Migration of Birds: The Canada Goose 1. What does it mean to "migrate"? 2. Which season is the hardest for wildlife? 3. Why do birds migrate?	14. (Obj. 8, 9, 19, 20, 23) Film: Migration of Birds: The Canada Goose 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. Emphasize that the geese migrate to a place where they will have plenty of food during the winter.

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Student Activities	Teacher Suggestions
	5. Emphasize that winter is a hard season of the year for all wildlife; especially birds.
15. (Obj. 13-18) Film: Plants Live Through the Winter 1. What does it mean to be an "annual" plant? 2. What are the buds on trees? 3. What are evergreen trees? 4. What kind of a plant is a sunflower?	15. (Obj. 13-18) Film: Plants Live Through the Winter 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. This film has a lot of terminology. Preview it to be sure you know what points you wish to emphasize. 4. Be aware of the "still" position on the film projector. This position will stop the film yet allow viewing of the frame during discussion. 5. This film will be helpful in achieving objectives 13, 14, 15, 16, 17, and 18. 6. It probably would be useful to show this film again immediately following the field trip as a reinforcement activity.
16. (Obj. 7-23) Picture Wheel 1. Tells a winter story of a plant, animal, insect, or bird. 2. The story can be told in writing or verbally. Pictures and drawings can be used too.	16. (obj. 7-23) Picture Wheel 1. This activity is designed to help the student know how winter affects wildlife and plants. 2. See Appendix X for a copy of the picture wheel. You should be able to duplicate it if necessary.

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Student Activities

Teacher Suggestions

3. The student should cut out one of the pictures and put it in the space indicated at the center of the wheel.
4. The student then should tell a story of how winter affects this particular animal, bird, insect, or plant.
5. The story may be told by writing, drawing pictures, or pasting cut-out pictures from magazines onto each space indicated by numbers 1 to 5.
6. Example: Picture of fox - 1) grows a heavy coat of fur, 2) does not hibernate, 3) does not migrate, 4) has a hard time finding food when snow covers ground, 5) still hunts rabbits, mice, etc.
7. This can be individual, small group, or a class activity.

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FIELD TRIP

TOPIC III: Plants in Winter

Overview of the Field Trip

The field trip for this unit will consist of a morning or afternoon tour of Dornwood Park. Transportation will be by means of a bus provided by the Environmental Education project. The main purpose of the trip will be to observe and discuss plant life during the winter. Objectives thirteen through eighteen will be covered by observing and discussing different kinds of plant life as the students are led on a walking tour of the park.

See Appendix XVII, Winter Field Trip Tips.

Behavioral Objectives:

13. Given four choices, 50% of the students will select "grass" as the plant that does not die in the winter.

14. Given four choices, 50% of the students will indicate that the main reason many trees do not grow much during the winter is because they lose their leaves.

15. Given four choices, 50% of the students will select "evergreen" as the kind of trees that do not lose their leaves during the winter.

16. Given four choices, 50% of the students will select "decay and turn into soil" as the thing that happens to plants that die during the winter.

17. Given four choices, 50% of the students will select "presence of buds' as a way of telling that trees are alive during the winter.

18. Given four choices, 35% of the students will indicate that a plant that produces seeds then dies each year is called an annual plant.

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FIELD TRIP ACTIVITIES

17. (Obj. 13-18)

Plant Life Observation

1. The program specialist will be responsible for the field trip. He will be assisted by paraprofessionals and qualified volunteers if needed.

2. The class should be divided into two or three groups for the tour of the park.

3. Each group will cover the same objectives on the trip.

4. On the tour the leader should be sure that the students observe and discuss the following:

   1) Grasses and other plants that are alive. Look for plants whose roots are still alive beneath the soil. Look for plants that still are green.

   2) Plants that have produced seeds then died (annual plants).

   3) Broadleaf trees that have lost their leaves. Briefly discuss leaves as a food maker for trees.

   4) Evergreens (needle leaves). Still produce food for winter growth.

   5) Plants and leaves that have died and begun to decay.

   6) Buds on trees. Buds indicate that the trees are alive. Buds will be new leaves.

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CLASSROOM FOLLOW-UP

TOPIC IV: Wildlife in Winter

Behavioral Objectives:

19. When given a choice of four season, 60% of the students will indicate that winter is the hardest season for wildlife.

20. Given four choices, 50% of the students will indicate that snow is a special hardship on some kinds of wildlife because it covers their food supply.

21. Given four choices, 75% of the students will select grasshoppers as the insect that will die because of cold weather.

22. Given four choices, 50% of the students will select "beetle" as the insect that will sleep through the winter.

23. Given four choices, 75% of the students will indicate that people can help birds in the winter by putting out food for them.

Student Activities	Teacher Suggestions
18. (Obj. 7-12; 19-23) Film: Animals in Winter 1. Can you name some animals that grow a heavy coat of fur in preparation for winter? 2. Can you name some animals that hibernate through the winter? 3. How do birds survive the winter? 4. Can people help birds during the winter? If so, how?	18. (Obj. 7-12; 19-23) Film: Animals in Winter 1. This film is available from the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of the film. 3. Preview the film then review unit objectives. 4. This film will be helpful in achieving all objectives relating to wildlife in winter.

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Student Activities	Teacher Suggestions
19. (Obj. 7-23) Plant and Animal Reports 1. Choose a plant or an animal and read all the books and magazines that have stories and pictures about them. 2. Tell the class all about the plant or animal. 3. Be sure to tell what happens to the plant or animal during the winter. 4. Show pictures of your plant or animal as you tell the class about them.	19. (Obj. 7-23) Plant and Animal Reports 1. This can be used as an individual or a group activity. 2. The students, or student, should select a plant such as broadleaf trees and make a report to the class about them. 3. They may select an animal such as a coyote or squirrel and make a report on it. 4. The report can include pictures of the plant or animal. 5. Specifically instruct the students to include in the report how winter affects the plant or animal.
20. (Obj. 7-12; 19-23) Story: Mother Nature's Snow Job 1. Listen to the story. Try to remember the animals that were mentioned.	20. (Obj. 7-12; 19-23) Story: Mother Nature's Snow Job 1. See Appendix XI for a copy of the story. 2. This story is taken from Ranger Rick's Nature Magazine, February, 1972. 3. Read the story to the class. 4. The story deals mostly with the benefits of snow. 5. Emphasize that a snow covering on the ground makes it very difficult for some animals, especially birds, to find their usual food. 6. The story can be good for enjoyment. 7. Discuss the story with the students after reading it to them.

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Student Activities	Teacher Suggestions
21. (Obj. 7-12; 19-23) Winter Wildlife Fill-Ins 1. Choose a word from the list of animals and insects and place it in the space so that it will make a correct sentence.	21. (Obj. 7-12; 19-23) Winter Wildlife Fill-Ins 1. This is a sentence fill-in type activity. 2. The student chooses the word that will successfully complete the sentence. 3. This is very much like Activity #13 (classification) one is meant to reinforce the other. 4. See Appendix XII for a copy of the fill-ins. It can be duplicated.
22. (Obj. 8, 11, 19, 20, 23) Film: Birds That Migrate 1. Can you name some reasons why some birds migrate? 2. Can you name some birds that migrate? Some that do not migrate? 3. What does it mean to "migrate"?	22. (Obj. 8, 11, 19, 20, 23) Film: Birds That Migrate 1. This film is in the Topeka Schools Film Library. Schedule it through your own school media center. 2. See Appendix XVI for a synopsis of film. 3. Preview the film then review unit objectives. 4. The narration is fast and the vocabulary is pretty high. Be sure you know the points of emphasis for this film. 5. Emphasize that food is one of the main reasons that birds migrate. 6. Get an explanation of what it means to migrate. 7. Be sure that the students can name some birds that do not migrate as well as those that do.

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Student Activities

23. (Obj. 7-12; 19-23)

Winter Poems

1. Listen as the poems are read by the teacher or a student.
2. Do you think the groundhog hibernates during the winter?
3. Does the snowshoe hare hibernate?

24. (Obj. 1-22)

The Question Box

1. Select questions from the question box. Read the question and let the other students, or groups, answer it.

Teacher Suggestions

23. (Obj. 7-12; 19-23)

Winter Poems

1. Three poems relating to winter are contained in Appendix XIII.
2. These poems were taken from Ranger Rick's Nature Magazine, February, 1972.
3. The poems are: A February Folk Tale; My Window Map; and The Snowshoe Hare.
4. These poems should be read to help develop a good feeling about winter.

24. (Obj. 1-22)

The Question Box

1. Prepare a number of questions relating to: 1) The Winter Season, 2) Wildlife In Winter, and 3) Plants in Winter.
2. Put each question on a small piece of paper.
3. Put each question into a rather large covered box. Leave a hole in the box large enough for a hand to reach into it.
4. You may choose to divide the class into different teams and have a contest.
5. You may choose to simply let one student reach into the box and select a question for the whole class to answer.
6. See Appendix XIV for sample questions.

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APPENDIX I

Making and Using a Thermometer

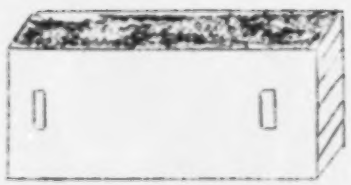
I. Making the Thermometer

Materials needed:

a. A cover from a box - it should be long enough for a 10" space between slits.
b. Red and white ribbon.
c. Stapler, or glue.

II. Specific Directions

a. Cut a slit at either end of a box to accomodate a ribbon.
b. Staple or glue one end of a 10" length of white ribbon to one end of a 10" length of red ribbon.
c. Slip ribbon through the slits.
d. Staple the two ends of the ribbon together.
e. Draw a thermometer bulb at the botton.
f. Draw a scale on the box beside the ribbon.



III. Suggestions for using the desk model thermometer

a. One morning you looked outside at the thermometer. Then you decided to wear a heavy coat to school. Was the thermometer high or low? Set your thermometer on the temperature that would be okay for a heavy coat.
b. Set your thermometers or determine the temperature that would be good for playing football.
c. Set your thermometer or determine the temperature that would be good for going swimming.
e. Set your thermometer on the temperature at which water freezes.
f. Make up your own situations for using the thermometer. See if you can stump the class.

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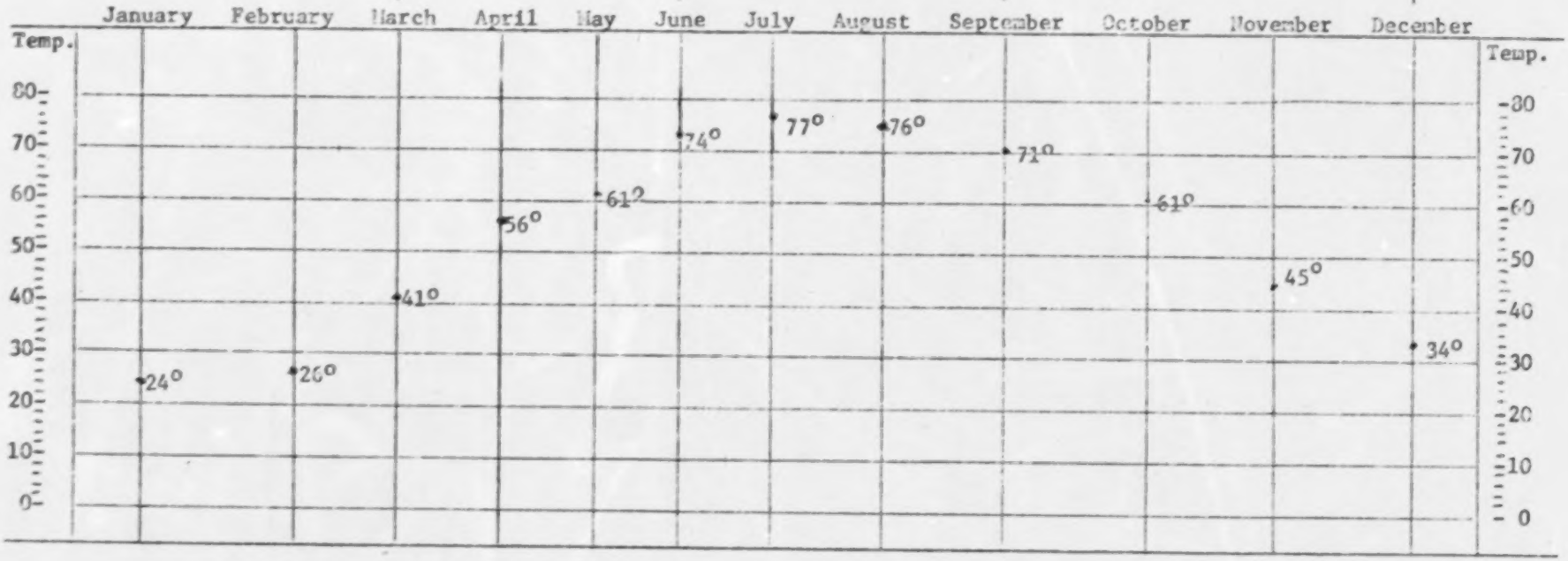
APPENDIX II
Season Graph

WINTER	SPRING	SUMMER	FALL
Many plants die. Some animals hibernate. Some birds migrate. Weather is usually cold. Days are short. Temperatures stay below 50°. Leaves are gone from most trees. Many insects have been killed by the cold. Some insects bury themselves under rock and bark of trees.	Buds on trees begin to bloom. Buds on trees turn into leaves. Temperature is usually about 50 to 70°. Days are getting longer. Hibernating animals are up and looking for food.	Plants are growing well. Temperatures can get very high - perhaps around 90°. Plants have flowers or small fruit. Animals usually have a good supply of food. Days are long. Leaves are usually green.	Leaves change colors. Many animals begin to eat a lot so they will get fat. Temperatures usually are about 50 to 60°. Many insects lay their eggs. Plants make seeds. Certain animals begin to store food for the winter. Certain animals begin to grow a heavy fur coat. Days get shorter.



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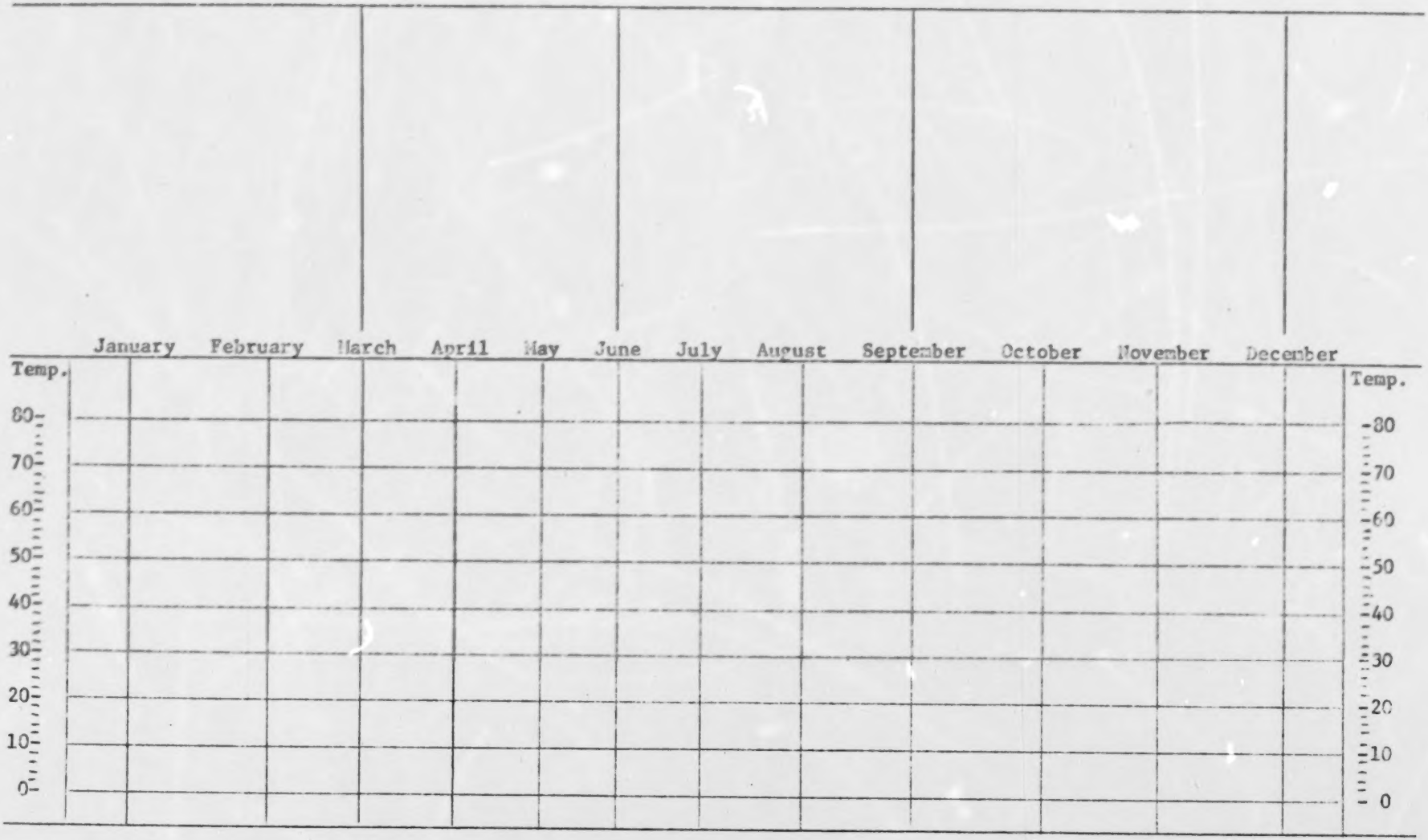
APPENDIX III
Season Graph



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APPENDIX IV
Season Graph Information

1. These are the average monthly temperatures for Topeka, Kansas.

1.	January	24 degrees	4.	April	56 degrees	7.	July	77 degrees	10.	October	61 degrees
2.	February	26 degrees	5.	May	61 degrees	8.	August	76 degrees	11.	November	45 degrees
3.	March	41 degrees	6.	June	74 degrees	9.	September	71 degrees	12.	December	34 degrees

2. The seasons occur during these months.
   1. Spring - begins on March 20, April, May, ends on June 20.
   2. Summer - begins on June 21, July, August, ends on September 21.
   3. Fall - begins on September 22, October, November, ends on December 20.
   4. Winter - begins on December 21, January, February, ends on March 19.

3. These are some things that happen during the different seasons. They are mixed up. Put them under their proper season on the form taken from Appendix II.
   1. Many plants die
   2. Days get longer
   3. Leaves are gone from most trees
   4. Plants have flowers or small fruit
   5. Days get shorter
   6. Insects eggs begin to hatch
   7. Leaves are usually green
   8. Days are short
   9. Temperature can get up to 90°
   10. Leaves change color
   11. Buds on trees bloom
   12. Some animals store winter food supply
   13. Days are long
   14. Animals begin to lose their shaggy fur coat
   15. Some animals hibernate
   16. A good season for swimming, boating, fishing, and picnicing
   17. Plants make seeds
   18. Some insects bury themselves beneath bark of trees or under rocks
   19. Plants grow well
   20. Temperatures are about 50 to 70 degrees
   21. Some animals eat a lot so they will get fat
   22. Birds begin to migrate back to their homes
   23. Some animals have a heavy fur coat
   24. Some animals begin to grow a heavy fur coat
   25. Temperatures stay below 50 degrees

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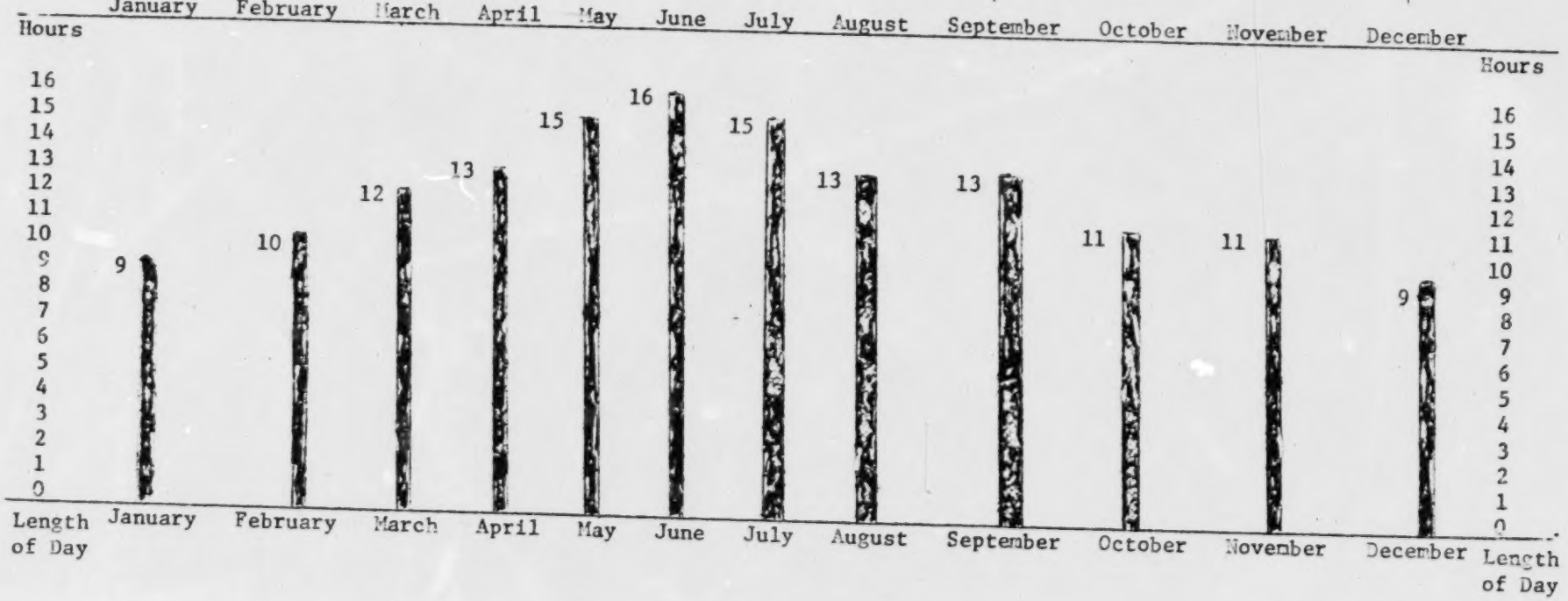
APPENDIX V

Length of Day Graph for Topeka, Kansas

WINTER	SPRING	SUMMER	FALL
Many plants die. Some animals hibernate. Some birds migrate. Weather is usually cold. Days are short. Temperatures stay below 50°. Leaves are gone from most trees. Many insects have been killed by the cold. Some insects bury themselves under rock and bark of trees.	Buds on trees begin to bloom. Buds on trees turn into leaves. Temperature is usually about 50 to 70°. Days are getting longer. Hibernating animals are up and looking for food.	Plants are growing well. Temperatures can get very high - perhaps around 90°. Plants have flowers or small fruit. Animals usually have a good supply of food. Days are long. Leaves are usually green.	Leaves change colors. Many animals begin to eat a lot so they will get fat. Temperatures usually are about 50 to 60°. Many insects lay their eggs. Plants make seeds. Certain animals begin to store food for the winter. Certain animals begin to grow a heavy fur coat. Days get shorter.



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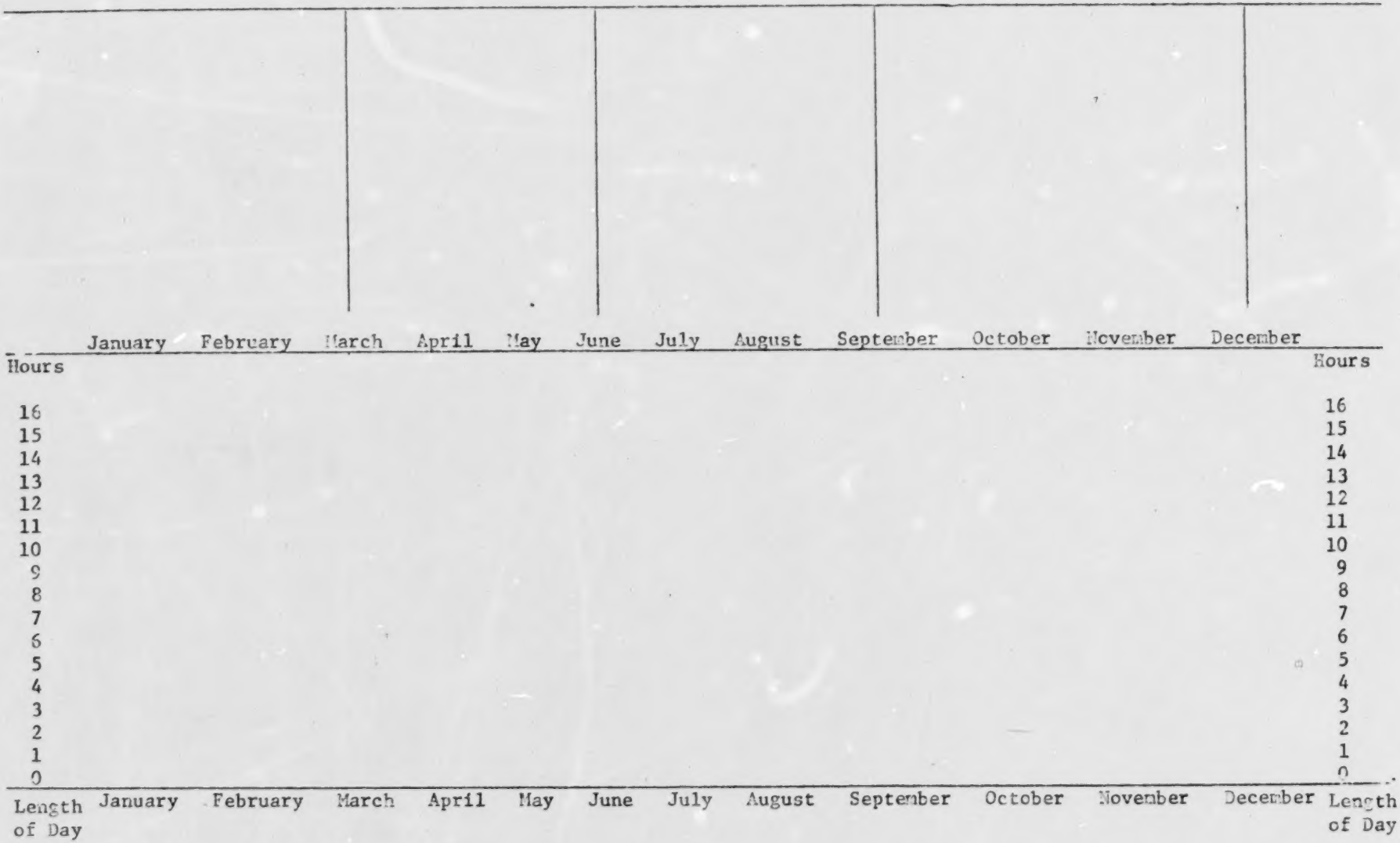
APPENDIX VI

Length of Day Graph for Topeka, Kansas



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APPENDIX VII

Information for Length of Day Graph for Topeka, Kansas

I. These are averages for the days of the months.

A. January has 9 hours of light in each day.

B. February has 10 hours of light in each day.

C. March has 12 hours of light in each day.

D. April has 13 hours of light in each day.

E. May has 15 hours of light in each day.

F. June has 16 hours of light in each day.

G. July has 15 hours of light in each day.

H. August has 13 hours of light in each day.

I. September has 13 hours of light in each day.

J. October has 11 hours of light in each day.

K. November has 11 hours of light in each day.

L. December has 9 hours of light in each day.

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APPENDIX VIII
Walk in the Winter Woods
By Ruth Smiley
Ranger Rick, January, 1972

Now that winter is here, don't hole up and hibernate as some animals do. Bundle up in your warmest clothes and go out into the woods. A walk in the winter woods can be fun.

Even if some animals are under cover, we can find tracks in the snow that tell stories about them. We have to be like detectives to figure out what the signs tell. A rabbit leaves a different mark in the snow than does a squirrel. Snow trails tell stories that sometimes have quick endings. A tiny mouse trail may end in blood and fur with the wing marks of a hawk or owl in the snow nearby.

Did you ever look closely at chewed branches of shrubs and trees? The special toothmarks that animals leave give them away. A bunny makes a clean cut while a deer tears a twig. The deer's upper teeth are not good for cutting.

At the base of a large pine tree you may see big chips of wood lying on the snow. This is your signal to look up the trunk. You may see the holes made by a woodpecker. When one of these birds goes after a grub buried in the trunk, it hammers out those wood chips with its strong beak.

Over in the shrubs is a huge ice cream cone! Last summer's bird's nest has caught the soft snow and held it--white against the black twigs. When we brush off the snow to peek, it looks like someone's leftover lunch inside. A mouse has moved in for the winter.

Farther along where some fruits have fallen from the berry bushes, the mice have paid a visit. Their dizzy tracks go in and cut over the snow and finally end at a hole. The heat of their little bodies has frosted the edge, trimming it in icy lace.

Chickadees hop from branch to branch among the birches, knocking down a shower of seeds. As if by magic, the tiny seeds on the snow look like a skyful of airplanes.

If it is late winter and you think spring is never going to come, just look up around you at the tips of branches. You will be surprised to see so much color. The red maple buds look almost ready to burst and soon the sap will be rising in the sugar maples. In winter when the trees are bare, it's fun to see if you know which tree is which. Look closely and you will see the differences in the buds. When you stand back and really look at the trunk and the bark, the trees will be like people--no two alike.

Winter is also a good time to look at the conifers. They drop their needles throughout the year. If you stand quietly in a pine forest you will find this out. Not all conifers are pines, as some people think. There are many different kinds. Some have very short needles such as the hemlock. Others have long needles

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like the pines. Still others are in between, like spruce and fir.

One of the nicest things of all is the way the dry leftover flowers at the edge of the woods catch the snow and hold it in pretty patterns. Goldenrod and Queen Anne's lace are good examples of this. Although ice storms sometimes damage trees, there is nothing lovelier than stems and branches coated with glittering ice. The grass and berries tinkle and sparkle like Christmas ornaments.

If you are lucky you may find an empty hornets' nest swinging from a tree limb. You can examine it and see that these insects have really found the answer to insulation. Count the thin papery layers with air space between that cover the inner cells. Have you ever watched a football game outdoors when it was very cold and put newspaper under your feet to keep warm? If you have, then you realize that hornets have known this trick for a long time.

One of the best finds of all is a dry, brown, baglike object about an inch and a half to two inches long hanging from a branch. Collect this egg case and keep it outdoors until spring. Then watch it carefully. A whole world of wonder awaits you.

When conditions are just right and the snow softens on the steep slopes, a tiny ball of snow may start downhill. The ball grows larger and larger as it travels. When it reaches the bottom it makes the nicest-looking snowball or snow doughnut.

By now your feet and hands are probably getting cold. It's time to go indoors for hot cocoa and popcorn.

THE END

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APPENDIX IX
Classification Sheet

1. Eats a lot of food in the fall; hibernates in the winter _____.
2. Buries itself in the mud and sleeps through the winter _____.
3. Sleeps beneath a rock or under the bark of a tree during winter _____.
4. Must look for plants to eat all through winter _____.
5. An annual plant - it grows seeds and dies each winter _____.
6. Migrates to a new place before winter arrives _____.
7. Stores food in trees and ground before winter arrives _____.
8. Lays eggs in the ground in the fall - dies when cold weather arrives _____.
9. Grows a heavy fur coat in preparation for winter. He is a predator. _____.

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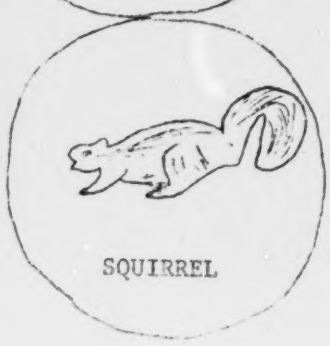
BEAR

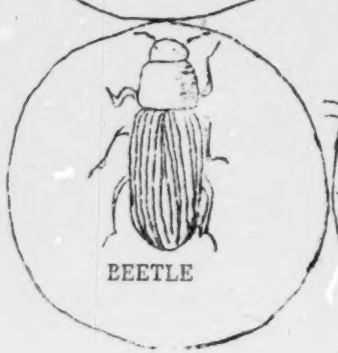
DUCK

FROG

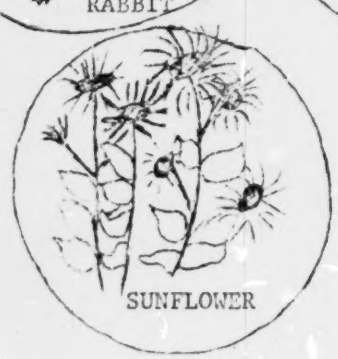
RABBIT

FOX


SQUIRREL


BEETLE

GRASSHOPPER


SUNFLOWER

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APPENDIX X
Picture Wheel

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APPENDIX XI
Mother Nature's Snow Job
By Robert Brownridge
Ranger Rick, February, 1972

"It sure has been a long time since the last snow," said Ranger Rick. He, Ollie Otter and Wesley Weasel were walking home from school with Miss Frances Flicker.

"Yes, hasn't it been great?" agreed Wesley. "No snowmobiles can go roaring through the woods, tearing up the shrubs, chasing and scaring animals."

It's been great not having to cancel school because of too much snow," said Miss Flicker.

"But there are also bad effects when we don't have enough snow," said Rick, "especially when it's very cold."

"Wow! You're right, Rick," agreed Ollie. "Just look at this bruise on my chest. I've worn away all the snow on my biggest and fastest slide and there's a rock right in the middle. That rock sure brought me to a screeching halt on the slide today."

"More important things than your slide are affected when there's cold weather without snow," said Rick.

"Yes," interrupted Wesley. "Since my fur has turned white for the winter, I can't hide very well when there's no snow. I have a hard time keeping out of sight when one of my hungry enemies is looking for me."

"Here comes little Margie Meadow Mouse," said Miss Flicker. "How do you think you did on the exam today, Margie?"

"All right, I guess," said Margie, "but I'm not doing very well finding food."

"That's the biggest problem for small animals," said Rick. "They can only eat the lowest twigs from the bushes unless snow bends the higher branches down where they can reach them."

"Hey, Margie, maybe I can help," said Ollie as he crouched low. "Climb up on my head and when I stand up you'll be able to reach the higher twigs."

"Your fur is really slippery, Ollie," said Margie. As Ollie started to stand up she cried, "Go slow, Ollie!"

"That is supposed to be 'Go slowly,' " corrected Miss Flicker.

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Appendix XI
Mother Nature's Snow Job (cont'd)

All of a sudden Margie lost her footing on Ollie's slick fur. "Look out!" called Rick. But Margie slid down Ollie's back and rolled into Ranger Rick.

"There must be an easier way to make a living," came a weak voice from the furry ball at Rick's feet.

"Those clouds up there may give us some snow tonight," observed Rick.

"I can help," said Miss Flicker. "I'll break off some of the higher twigs and drop them down to you." She snapped off some twigs which were brittle from the cold. Margie gathered them until she couldn't carry any more.

"Thank you, Miss Flicker," she said.

Wesley Weasel gave a squeal of delight. "Look, I see some snowflakes falling!"

"I hope this develops into a good snowfall," said Rick. "We'll find out tomorrow. I'll see all of you in the morning, and I hope I'll be able to show you some of the benefits we get from a heavy blanket of snow."

As the friends parted to go to their homes, it began to snow harder. Each of the animals, for his own reasons, was hoping for a heavy snowfall.

The snowstorm lasted most of the night. By morning there was a thick layer of fluffy whiteness all over Deep Green Wood.

Seconds after the first light of morning broke through the trees, the air was full of the excited chattering of animals playing in the fresh snow.

Sammy Squirrel was running through the snow calling to his friends, "There's no school today because of the snow!"

"Hey, Sammy, I'll bet you can't find me," called Wesley Weasel. Wesley's white coat matched the snow around him perfectly. Sammy came within inches of Wesley without seeing him.

Suddenly Wesley jumped up and scared Sammy so badly that he scampered up the nearest tree. "You turned almost as white as I am," laughed Wesley. Then he called, "Here comes Ranger Rick! Bet he's all ready with his number one lecture on Mother Nature's snow job."

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Appendix XI
Mother Nature's Snow Job (cont'd)

"Well, she did do a good job," said Sammy. "She gave us lots of new places to play."

"You know there's more to it than that," said Rick. "This deep snow gives nature a chance to do a lot of important work even in the cold winter while plants are resting."

"Snow isn't exactly warm," said Sammy.

"But it acts as an insulator," replied Rick. "That means that it keeps the subzero cold and winds from freezing the plants to death. If some plants aren't covered up in the bitter cold winter, they won't bloom in the spring.

"One of the biggest problems caused by lack of snow," continued Rick, "is that we don't have enough water in the spring. When the snow melts, most of it soaks into the ground. It supplies extra water for wild plants and for farmer's crops as they start to grow. That means there will be more food for us and for humans.

"Waterfowl benefit too because melting snow fills potholes where they make their nests and raise their young. If nesting areas don't get enough water early in the spring, many waterfowl won't nest. Those that do build nests cannot swim away from their enemies if the potholes are dry."

Margie Meadow Mouse cam bouncing through the snow with her cheeks full of little twigs.

"Did you have any trouble getting food today?" asked Rick.

"Standing on top of the snow was a lot easier than standing on Ollie's wet back," laughed Margie. "I could reach all the food I needed."

"Hey, Rick, don't forget about those of us who live down here," came a voice from under the snow.

"Who's that?" asked Sammy Squirrel, peering sharply at the snow from his perch in the tree.

"I'll bet that's Diggy Mole," said Rick.

"Right," said Diggy, not bothering to stick his head above the snow. "The snow is so much easier to dig in than hard cold earth. I hear a tremendous roar overhead. Some of my tunnels collapse and the snow gets packed down. When the air gets pushed out of it, it isn't a very good insulator. Also, it's harder to dig in. What's that noise, Rick?"

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Appendix XI
Mother Nature's Snow Job (cont'd)

"People on snowmobiles," said Rick.

Sammy, perched in the tree, had been trying to decide where Diggy's voice was coming from. Suddenly he took a leap to where he thought Diggy might be.

"Geronimo!" screamed Sammy as he flew through the air. When he landed, the snow around him collapsed, taking Sammy down in a flurry of white. "Help, avalanche!" he screamed.

"Relax," said Welsey. He grabbed Sammy by the tail and pulled him back to the top. "That will teach you to jump on top of a mole's tunnel."

"I just thought of how our Rangers could have a good time in the snow," said Rick.

"Falling into mole tunnels?" asked Sammy somewhat grimly.

"No," said Rick. "They can go through the woods and see how many animal footprints they rocognize. They might keep a diary to see which animals travel in certain areas."

"Yes, tell them to drop in some time," laughed Diggy Mole.

"I'm sure all the Rangers will enjoy their walks in the snow even more when they know how much good snow does for plants and animals. Besides, think of the fun they can have sledding, skiing and building snowmen," said Rick.

THE END

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APPENDIX XII
Winter Wildlife Fill-Ins

Fill in the blank spaces with the names of one of the animals listed below.

Wolf	Coyote	Rabbit	Squirrel	Snake
Ant	Monarch Butterfly	Deer	Raccoon	Fish
Frog	Bear	Mouse	Beetle	Grasshopper
Duck	Woodpecker	Turtle	Fox	

1. A _____ does not hibernate. It grows a shaggy fur coat to protect it from the cold.

2. A _____ _____ is an insect. It flies to a warm place during the winter.

3. A _____ has a nice warm coat of fur for winter. It must look for plants during the winter. It is sometimes a prey for the fox.

4. A _____ can sometimes be found sleeping (hibernating) beneath a rock during the winter season.

5. A _____ eats a lot of food during the fall season. It becomes fat. It hibernates during the winter season.

6. A _____ lays its eggs in the ground during the fall. It dies when cold winter weather comes along.

7. A _____ will sometimes eat the bark off of trees during the winter season if the snow has covered up all the grass.

8. A _____ will dig into the mud during the winter months.

9. A _____ stores nuts and seeds in holes in trees and in the ground.

10. A _____ is a kind of bird. It flies to a warm place during the winter season.

11. A _____ is a bird. It does not migrate. It stores up food for the winter.

12. A _____ is an insect. It spends the winter sleeping under a rock or buried under the bark of a tree.

13. A _____ will make its winter home in the mud at the bottom of a pond.

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Appendix XII
Winter Wildlife Fill-Ins (cont'd)

14. An _____ stores seeds of weeds and other plants in its hill. It grows fungi for its nest underground. Aphids suck juices from plants and the _____ gets the juice from them.

15. A _____ will store part of its winter food underground.

16. A _____ will spend most of the winter lying near the bottom of a lake or pond.

APPENDIX XIII
Winter Poems
Ranger Rick, February, 1972

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A FEBRUARY FOLK TALE

The groundhog is supposed to know
If we'll get more ice and snow.
On February 2nd, he
Comes from his burrow just to see
If his shadow will appear
On the ground, distinct and clear.
Six more weeks of winter's blast
Will follow if his shadow's cast.
But, if it isn't, rest secure;
Those six weeks will be mild, for sure.
It's said his forecast will not fail.
But this is just a silly tale!
Mister Groundhog's much too wise
To open up his sleepy eyes
And poke his nose above the ground,
While ice and snow are still around.
--Daphne Hogstrom

MY WINDOW MAP
--Lola Sneyd

Sometimes I travel rivers
That flow into the seas,
Or scale the lofty mountains,
Or soar above the trees.

I follow paths to castles
With turrets, moats and all;
I visit crystal cities
With skyscrapers so tall.

I never plan my journeys,
Yet all the world I see...
I travel via window maps
That Jack Frost paints for me.

THE SNOWSHOE HARE

This hare, in the summer,
Is colored field-brown.
In fall, as the air chills
And soft snow falls down,

His fur gets some patches
As white as the snow--
Since he matches the earth,
He still doesn't show.

When winter blows in
He is quite out of sight,
For he, like the whole earth,
Is nothing but white.

With his large snowshoe paws
That are made wide and furry,
He runs on the snow
With a quick-as-quick scurry.

In springtime this hare,
Once as white as the snow,
Is turning field-brown
As the winter snows go.
--Mary Kullberg

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APPENDIX XIV
The Question Box

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These questions can be used for the question box, activity number 24.

1. Can you name three plants that do not die during the winter?
2. Can you tell why many trees will not grow very much during the winter?
3. Can you name a kind of tree that does not lose its leaves during the winter?
4. During the winter, what part of a tree will tell you that it is alive?
5. What is a plant called that makes seeds and then dies every winter?
6. What happens to leaves that fall from the trees during the winter?
7. Which season of the year is the hardest for wildlife?
8. Why is snow so hard on wildlife?
9. What insect sleeps through the winter under a rock or under the bark of a tree?
10. Can you name two insects that die because of the cold weather during winter?
11. How can people best help birds during the winter?
12. How does a fox get ready for winter?
13. What do wild geese do just before the winter season begins?
14. Does a rabbit hibernate during the winter?
15. Animals that hibernate during the winter usually spend the fall doing something that gets them ready for hibernation. What is it?
16. What is it called when birds fly from one place to another to spend the winter?
17. Can you give two reasons why some animals hibernate during the winter?

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Appendix XIV
The Question Box (cont'd)

18. How many seasons are there in a year?

19. Can you name the seasons of the year?

20. Which season comes during December, January, February, and March?

21. Would the thermometer show 90 degrees during the winter?

22. Which of these months would probably have a temperature of 10 degrees? April, July, September, or January?

23. Which of these months would have the shortest days? May, August, October, or February?

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APPENDIX XV
Unit Related Audio-Visual Materials

This list of Audio-Visual Materials is but a small portion of the total audio-visuals found in our school system that are available and relevant to this curriculum. A complete list of audio-visual materials is available in each school's media center.

To borrow materials from another school, a teacher should make the request through their own school's media center. No delivery service is available for this type of material, so teachers will need to pick up and return borrowed items.

SUBJECT	TITLE	TYPE	SOURCE	CALL NUMBER	SCHOOL
Animals: Artic Region	Rodents of the Northland	FS	EBE	599.3	Highland Park High School
Animals: Artic Region	Walrus Colony	F	EALI	599	Potwin
Animals: Habitats and Behaviors	The Big Snow	FS	WEST	E	Highland Park South Stout
Reptiles	Temperature and Activity in Reptiles	F	BIOL	598.1	Topeka West High School
Plants	Climate and Plants	FS	POPU	551.6	Potwin
Snow: Animals: Habitat and Behavior	Caldecott Medal Library No. 1001A	K	WEST	E	Stout
Temperature	Control of Body Temperature	FS	EBE	612.5	East Topeka Junior High
Temperature	Hot and Cold	FS	TROL	536	Highland Park North
Thermometers	Making a thermometer: A Study of Temperature Scale	FS	EBE	536	Potwin

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Appendix XV
Unit Related Audio-Visual Materials (cont'd)

SUBJECT	TITLE	TYPE	SOURCE	CALL NUMBER	SCHOOL
Thermometer	Making a Thermometer	FS	EBE	536	French Junior High
Winter	In the Winter	PI	SVE	525	Bishop Lowman Hill Lundgren Potwin Randolph
Winter	Winter Comes To the Country	FS	McGR	525	Avondale East
Winter	Winter is Here	FS	SVE	525	Parkdale Rice
Winter	Winter Adventures	FS	SVE	525	Crestview Monroe Potwin Rice
Winter	Through the Seasons	FS	McGR	525	
Bird - Migration	Birds	K	EBE	598.2	Avondale East Gage Stout
Birds - Migration	American Migratory Birds	F	DOUB	598.2	Bishop

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APPENDIX XVI
Film Synopsis

SEASONS OF THE YEAR Coronet 11 min. C 1959

The film offers a year of experience compressed into simple terms. Highlights activities through each season--including changes in human activities.

WARM AND COLD BLOODED ANIMALS Coronet 14 min. C 1971

Laboratory experiments are combined with cinematography of fish, reptiles, birds, and mammals to demonstrate the characteristics of cold and warm blooded animals.

WINTER: A STORY OF SURVIVAL ACI 14 min. C 1968

Unusual nature photography studies the effect of the winter season on plant and animal life.

BIRDS IN WINTER EBE 11 min. C 1958

Important concepts on animals and the season. Scenes photographed in various parts of the country feature a wide range of bird life.

HIBERNATION: FORMS OF DORMANCY EBE 11 min. C 1962

Provides a remarkable camera study of various animals adjusting to the hardships of their environment during the winter months. As food becomes scarce and temperatures change, some animals, such as the ground squirrel, go into hibernation. Some, like the spadefood toad, go into a deep sleep called estivation, others such as the bear and raccoon, merely sleep for long periods of time.

MIGRATION OF BIRDS: THE CANADA GOOSE EBE 11 min. C 1959

Tells the migration story of the Canada Goose, because its spectacular flights are known to most people. Shows northward migration flight and its completion in southern Canada, also nesting, raising young, flocking, finally migrating to winter quarters along the Gulf of Mexico.

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APPENDIX XVI
Film Synopsis (cont'd)

PLANTS LIVE THROUGH THE WINTER Coronet 11 min. C 1968

Defines perennials, biennials, and annuals, and shows what happens to each kind of plant in winter.

ANIMALS IN WINTER EBE 11 min. C 1950

Studies various wild animals as they prepare for and live through the winter. Shows that some animals prepare winter homes for themselves, some store food, some hibernate, some change in appearance as winter comes, and some live through winter in different form.

BIRDS THAT MIGRATE Coronet 16 min. C 1968

Birdbanding and other records have established four great migratory flyways across North America. Migrants using these routes are illustrated by twenty-seven species.

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APPENDIX XVII
Winter Field Trip Tips

1. Proper dress is important. Warm shoes or boots, gloves, cap or scarf to cover ears, and a warm coat are a must. Girls should wear slacks or jeans so their legs will be covered.

2. No lunches will be needed.

3. No toilet facilities are available. Be sure to encourage the students to use the restroom before they leave the school.

4. Inform the students exactly what the trip is about.

5. Snow will not be a reason to cancel the trip.

6. Rain or very severe cold would probably be a cause for postponing the trip.

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APPENDIX XVIII
Instruction for Administering Test

1. There is only one answer per question.

2. The students may circle the letters to indicate their answer or they may underline the whole answer. As a teacher, you are free to change the method by which they indicate their answers to fit your own situation.

3. Feel free to change the wording of the questions. Be sure that the student understands what the question is asking.

4. The students' first and last name should be on the test.

5. Each question relates to a specific objective (question 1 relates to objective 1). If you did not teach a certain objective, skip that question.

6. You may administer the test to the entire class at one time or individually.

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TEST

1. How many seasons are there in a year?

   a. one 1
   b. two 2
   c. three 3
   d. four 4

2. The seasons of the year are spring, summer, fall, and winter.

   a. true
   b. not true

3. Choose the months of the winter season.

   a. December, January, February, March
   b. March April, May, June
   c. June, July, August, September
   d. September, October, November, December

4. Which of these temperatures would probably not occur during the winter?

   a. 10 degrees
   b. 40 degrees
   c. 5 degrees
   d. 90 degrees

5. Which month would be most likely to have a temperature of 10 degrees F.?

   a. April
   b. January
   c. July
   d. September

6. Which month would have the shortest days?

   a. August
   b. February
   c. May
   d. October

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7. Some animals get ready for winter by:

   a. Not eating anything
   b. Growing a heavy coat of fur
   c. Growing taller
   d. Running away from other animals

8. What do some birds do as winter gets close?

   a. Grow more feathers
   b. Hibernate
   c. Migrate
   d. Quit eating

9. Which of these animals <u>do not</u> hibernate during the winter?

   a. Bear
   b. Snake
   c. Frog
   d. Rabbit

10. Which of these things will an animal do before he begins hibernating?

    a. Get a lot of exercise
    b. Eat a lot of food
    c. Chase other animals away
    d. Set their alarm clock

11. Which group of words tells what it means to <u>migrate</u>?

    a. Move from one area to another
    b. Go into a cave and sleep
    c. Grow a heavy coat of fur
    d. Eat a lot of food

12. Which best explains why some animals hibernate during the winter?

    a. They are afraid of other animals
    b. They are tired
    c. There is not enough food
    d. They do not like snow

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TEST (cont'd)

13. Which of these plants do not die during the winter?

a. Sunflowers
b. Corn
c. Tomato
d. Grass

14. Most trees do not grow much during the winter season. Why?

a. Too much rain
b. Too much snow
c. Too many clouds
d. They lose their leaves

15. Which kind of trees do not lose their leaves during the winter?

a. Evergreen
b. Broadleaf
c. Oak
d. Hickory

16. What happens to plants that die during the winter?

a. They grow again next year
b. They decay and turn into soil
c. Water washes them away
d. They burn up

17. Which statement tells a way to determine if trees are alive during the winter?

a. Pinch them
b. Ask them
c. You can find buds on them
d. They will have green bark

18. A plant that grows seeds then dies each year is an:

a. Semi-annual plant
b. Tall plant
c. Short plant
d. Annual plant

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TEST (cont'd)

19. Which season is the hardest on wildlife?

    a. Fall
    b. Winter
    c. Spring
    d. Summer

20. Why is snow hard on some kinds of wildlife?

    a. It covers up their food
    b. It smells bad
    c. It is too cold
    d. It is too wet

21. Which insects are killed by cold weather?

    a. Ants
    b. Monarch Butterflies
    c. Grasshoppers
    d. Beetles

22. Which insect will sleep through the winter?

    a. Monarch Butterfly
    b. Beetle
    c. Grasshopper
    d. Mosquito

23. How can people help birds in the winter?

    a. Keep them in the house
    b. Give them water
    c. Leave them alone
    d. Put out food for them